CLAIMS

1. A method of adapting coding schemes used on a downlink channel of a wireless packet data communication system to data resource limits of a mobile station coupled to a peripheral device, comprising:

transmitting a set of data on the downlink channel to the mobile station using a current combination of coding schemes that have a current data rate;

monitoring whether a data transfer rate of the peripheral device has been exceeded; and

establishing an optimal combination of coding schemes to be the current combination of coding schemes when a search criterion that is based on whether the data transfer rate of the peripheral device has been exceeded is met.

2. The method according to claim 1, further comprising:

determining a new combination of coding schemes that have a new data rate different than the current data rate when the search criterion has not been met;

setting the new combination of coding schemes to be the current combination of coding schemes; and

repeating the transmitting, monitoring, determining, and setting until the search criterion has been met.

3. The method according to claim 1, wherein an initial value of the current combination of coding schemes consists of a highest coding scheme supported by the mobile station, transmitted using a highest duty cycle.

4. The method according to claim 1, wherein the search criterion is that the data transfer rate of the peripheral device has not been exceeded, and the establishing comprises determining the new combination of coding schemes to have a new data rate that is less than the current data rate.

5. The method according to claim 4, wherein the establishing comprises determining the new combination of coding schemes to have a new data rate that is one half of the current data rate.

6. The method according to claim 1, wherein the search criterion is

a result of monitoring whether the data transfer rate of the peripheral device has been exceeded is changed from a previous result, and

an absolute value of a difference of the current data rate and a most recent data rate is less than a precision limit, and

wherein the establishing comprises

establishing the new combination of coding schemes to have a new data rate that is different than the current data rate by an amount that has a sign based on the result of monitoring, and an absolute value based on the current data rate and the most recent data rate.

7. The method according to claim 1, wherein the optimal combination of coding schemes includes coding schemes that vary from frame to frame in one of coding scheme level and duty cycle, and provide a common average data rate.

8. The method according to claim 7, wherein the optimal combination of coding schemes is varied to allow frame sharing with other mobile stations.

9. The method according to claim 1, wherein the monitoring of whether a data transfer rate of the peripheral device has been exceeded comprises determining whether intervals of acknowledgements transmitted from the mobile station on an uplink channel in response to the set of data meet uniformity criteria.

10. The method according to claim 9, wherein the monitoring further comprises determining that the downlink and uplink channels are sufficiently error free.

11. The method according to claim 1, further comprising determining a buffer depth of the mobile station when the search criterion has been met.

12. The method according to claim 11, wherein the determining of the buffer depth comprises:

transmitting a long set of data on the downlink channel to the mobile station using a fast combination of coding schemes that has a fast data rate that is supported by the mobile station and is greater than a data rate of the optimal combination of coding schemes;

determining a duration from a start of the transmitting to a time at which a buffer depth of the mobile station has been exceeded; and

estimating the buffer depth of the mobile station,based on the duration and a difference of the fast data rate and a data rate of an other combination of coding schemes.

13. The method according to claim 12, wherein the other combination of coding schemes is the optimal combination of coding schemes.

14. The method according to claim 12, wherein determining that the buffer depth has been exceeded comprises determining that intervals of acknowledgements transmitted from the mobile station on an uplink channel in response to the long set of data meet non-uniformity criteria.

15. The method according to claim 14, wherein determining that the buffer depth has been exceeded further comprises determining that the downlink and uplink channels are sufficiently free from errors.

16. The method according to claim 1, wherein the wireless packet data communication system is one of a General Packet Radio Service, an Enhanced General Packet Radio Service, and a Universal Mobile Telecommunications System.

17. The method according to claim 1, further comprising sending a data message to the mobile station using the optimal combination of coding schemes.

18. The method according to claim 1, further comprising transmitting data of a long set of data to the mobile station using a combination of coding schemes that has a data rate exceeding a data rate of the optimal combination of coding schemes until the buffer depth of the mobile station is calculated to be filled, then using a combination of coding schemes having a data rate less than or equal to the data rate of the optimal combination of coding schemes for subsequent transmissions of data of the long set of data.

19. A method of adapting a coding scheme used on a downlink channel of a wireless packet data communication system to data resource limits of a mobile station coupled to a peripheral device, comprising:

establishing an optimal combination of coding schemes that is less than a data transfer rate of the peripheral device; and

determining a buffer depth of the mobile station after the optimal combination of coding schemes has been established.

20. The method according to claim 19, further comprising transmitting data of a long set of data to the mobile station using a combination of coding schemes that has a data rate exceeding a data rate of the optimal combination of coding schemes until the buffer depth of the mobile station is calculated to be filled, then using a combination of coding schemes having a data rate less than or equal to the data rate of the optimal combination of coding schemes for subsequent transmissions of data of the long set of data.

21. A base station controller, comprising:

a function that transmits a set of data on a downlink channel to a mobile station using a current combination of coding schemes that have a current data rate;

a function that monitors whether a data transfer rate of a peripheral device has been exceeded; and

a function that establishes an optimal combination of coding schemes to be the current combination of coding schemes when a search criterion that is based on whether the data transfer rate of the peripheral device has been exceeded is met.

22. The station controller according to claim 21, wherein the function of monitoring of whether a data transfer rate of the peripheral device has been exceeded comprises a function of determining whether intervals of acknowledgements transmitted from the mobile station on an uplink channel in response to the set of data meet uniformity criteria.

23. The station controller according to claim 22, wherein the function of monitoring further comprises a function of determining that the downlink and uplink channels are sufficiently error free.

24. The method according to claim 21, wherein a function of determining of a buffer depth comprises:

a function of transmitting a long set of data on the downlink channel to the mobile station using a fast combination of coding schemes that has a fast data rate that is supported by the mobile station and is greater than a data rate of the optimal combination of coding schemes;

a function of determining a duration from a start of the transmitting to a time at which a buffer depth of the mobile station has been exceeded; and

a function of estimating the buffer depth of the mobile station, based on the duration and a difference of the fast data rate and a data rate of another combination of coding schemes.

25. A base station controller, comprising:

a function that determines an optimal combination of coding schemes that has an optimal data rate less then or equal to a transfer data rate of a peripheral to a mobile station;

a function that determines a buffer depth of the mobile station; and

a function that transmits data of a long set of data to the mobile station using a combination of coding schemes that has a data rate exceeding the optimal data rate until the buffer depth of the mobile station is calculated to be filled, then uses a combination of coding schemes having a data rate less than or equal to the optimal data rate for subsequent transmissions of data of the long set of data.